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ABSTRACT

The Water in Africa Project was realized over a 2-year period by a team of Peace Corps volunteers, World Wise Schools (WWS) classroom teachers, and WWS staff members. As part of an expanded, detailed design, resources were collected from over 90 volunteers serving in African countries, photos and stories were prepared, and standards-based learning units were created for K-12 students. This unit, intended for students in fourth to sixth grades, deals mostly with the Cape Verde Islands (Republic of Cape Verde), 10 islands and 5 islets located off the coast of West Africa. Students learn about the scarcity and importance of a continuous supply of fresh water on Cape Verde and then research five methods of obtaining and conserving water on Cape Verde. They research five methods of obtaining and conserving water and then create displays and give oral presentations to demonstrate their understanding of the methods. The oral presentations are made in the context of a simulation, which allows the students to weigh the costs and benefits of each method. The unit can be used in social studies, science, or language arts classes. Four to five 40-minute class periods are suggested. The unit lists materials needed, outlines applicable standards, poses discussion questions, and gives student objectives. It details day-by-day procedures for the teacher, suggests follow-up/enrichment activities, and lists on-line and print resources. (BT)

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Water in Africa

PEACE CORPS

Water Sources in Cape Verde and West Africa

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Water in Africa is a project of Peace Corps World Wise Schools.

2000

Funded through a grant from the Department of Education, the Water in Africa project was realized over a two year period by a team of Peace Corps Volunteers, World Wise Schools' (WWS) classroom teachers, and WWS staff members. Inspired by an idea of one creative WWS teacher, the project eventually expanded into a detailed design. The development and implementation of the design included the collection of resources from over 90 Volunteers serving in African countries, the preparation of those photos and stories, and the creation of standards-based learning units for K-12 students.

Water Sources in Cape Verde and West Africa

Description:

The Republic of Cape Verde, which consists of 10 islands and five islets is located off the coast of West Africa. In this unit students learn the scarcity and importance of a continuous supply of fresh water in Cape Verde. They subsequently research five methods of obtaining and conserving water on Cape Verde. Then they create displays and give oral presentations to demonstrate their understanding of the methods. The presentations are made in the context of a simulation, which allows the students to weigh the costs and benefits of each method.

Timeframe: Four to five 40 minute lessons

Curricular Areas: Social Studies, Science, Language Arts

Grade Level: Grades 4-6

Materials

- Photos and Stories from the Water in Africa Web site for:
  - Cape Verde http://www.peacecorps.gov/wws/water/africa/countries/capeverde/index. html
  - Togo http://www.peacecorps.gov/wws/water/africa/countries/togo/index.html
  - Guinea http://www.peacecorps.gov/wws/water/africa/countries/guinea/index.html
  - Kenya http://www.peacecorps.gov/wws/water/africa/countries/kenya/index.html
  - Tanzania http://www.peacecorps.gov/wws/water/africa/countries/tanzania/index.html
  - Mauritania http://www.peacecorps.gov/wws/water/africa/countries/mauritania/index.html
- Reference sources (print and/or electronic) for research on desalination, drip irrigation, water catchment systems, pumps and wells, and springs and water collection devices.
- World Map
- Map of Cape Verde
- A gallon container, salt, water, food coloring, flat dishes, hand lenses
- The Source of My Water by Brandon Lundy
- Cape Verde Study Guide
- Cape Verde Islands Background
- Electronic Resource List
- Water in Africa Web Site Reference Sources
- Evaluation Rubric
- Cape Verde Simulation Scenarios

Standards

Geography Standard 14: Understands how human actions modify the physical environment

Benchmark-- Knows the ways people alter the physical environment

Benchmark-- Knows how human activities have increased the ability of the physical

environment to support human life in the local community, state, United States, and other countries (e.g. use of irrigation and dry-land farming techniques to improve crop yields, reforestation to prevent erosion, flood control projects to make land habitable).

Language Arts Standard 8: Demonstrates competence in speaking and listening as tools for learning

Benchmark-- Makes eye contact while giving oral presentations

Benchmark-- Responds to questions and comments (e.g. gives reasons in support of opinions).

Benchmark-- Makes some effort to have a clear main point when speaking to others

Benchmark-- Organizes ideas for oral presentations

Science Standard 1: Understands basic features of the earth

Benchmark-- Knows the major differences between fresh and ocean waters

Life Skills--Working With Others Standard 1: Contributes to the overall effort of a group

Benchmark-- Helps the group establish goals

Benchmark-- Takes the initiative when needed

Benchmark-- Evaluates the overall progress of a group toward a goal

Essential Questions

What is "fresh water"?

How can we use ocean resources to help us without adversely affecting the ocean?

How do people affect and change the environment?

Objectives

Students will:

- conduct research about water issues by reading stories and viewing photos about Cape Verde on the Water in Africa website.
- identify two or more reasons for the lack of fresh water in Cape Verde.
- complete a research assignment on water in Cape Verde.
- give an oral presentation and complete a display based on the results of their research.
- assess their own work on the oral presentation and the display.

- identify the strengths /weaknesses of each method of obtaining or conserving water in Cape Verde.
- participate in the simulation session on the future direction of water procurement/conservation efforts in Cape Verde.

Procedure

Procedure-Day One

1. Before class, duplicate the following for your students: The Source of Your Water by Brandon Lundy (also available online at http://www.peacecorps.gov/wws/water/africa/countries/capeverde/source.html)
   Cape Verde Study Guide (First two pages-the third page is suggested answers.)
   Cape Verde Islands Background Information
   Map of World
   Map of Cape Verde

2. Ask the students to answer a riddle: What is the most basic need shared by everyone in the world? Ask the students to answer another riddle: What is something that people sometimes can't get enough of, even when they're surrounded by it? Entertain answers, and tell students that the answer to both questions for the people of one West African island nation is "water".

3. Ask the question "What is fresh water?" Discuss this with the students, looking for answers that emphasize ability to use the water immediately, "fresh" meaning clean water and water that does not come from the ocean--the opposite of salt water. Then ask the students "What are sources of fresh water for us?" Discuss the answer(s) with the students, looking for answers pertinent to your region.

4. Show the students the location of Cape Verde on the world map and the map of Cape Verde at the Water in Africa Web site or on the attached maps printed from the site.

5. Distribute, or display, Brandon Lundy's story "The Source of your Water" from the Water in Africa Web site. Read it with the students. Have the students explain to a partner seated nearby how water is the answer to the riddle, so both people understand it.

6. Tell the students the story of Cape Verde's name. (Sailors were surprised to see green trees on the mountainous islands, as a contrast to the barren Saharan coastline farther north, so they named the island "Verde" or green in Portuguese.) Point out the irony of water making things green, but yet being a hard commodity to obtain many times during the year. Mention that the mountain springs may have been the source for the water for the green mountains the sailors spotted.

7. Distribute the Background Resource on Cape Verde. Read this article with the students to help them learn more about Cape Verde.

8. Distribute the first two pages of Cape Verde Study Guide, to each student. Look for the answers to the first two questions using the story "The Source of your Water." Explain that they will be using the Water in Africa Web site to learn how people in Cape Verde try to solve the difficult problem of a lack of fresh water by taking advantage of the resources available to them.

9. Divide the students into small groups, and have them answer the remainder of the questions on the study guide by reading the stories and the picture captions, and viewing the photos. Use the answers given on the last sheet

10. Tell students to keep their completed study guides for the next day

Procedure Day Two

1. Before class prepare a mixture of salt, water, and food coloring by dissolving as much salt as possible (1.5cups) in a gallon of water colored by a few drops of food coloring (blue and green).

2. Direct the students' attention to the mixture of salt, food coloring, and water in the gallon jug. Ask them what they think is the gallon jug and how they could verify their answers. (Tasting is not a safe way to confirm a hypothesis for mystery liquids. Point this out).

3. Pour some of the liquid into a flat dish and set it in a warm place. Have the students predict what will happen to the mixture.

4. When the water is evaporated let the students study the salt crystals on the dish with hand lenses. Discuss how this procedure imitates, and differs from the desalination process used at Cape Verde.

5. Remind the students of the riddles, and the answer to them, and ask how the people of Cape Verde are trying to use the ocean to their advantage. (See Brandon Lundy's comments on transportation). Point out that desalination plants exist in other places in the world, including the United States, and that they will be finding out more about desalination in the next few days.

6. Tell the students they will now be doing research on methods of procuring and conserving water that people in the United States use, as well as the people of Cape Verde. Advise them that this research will help them learn how people get /conserve water in their own region of the United States, so they will learn how water becomes a part of their lives. List these five methods on the board: desalination, irrigation, pumps and wells, mountain springs, and rainwater collection systems. Review the vocabulary for each of these methods, and ask the students for background knowledge they might have on the methods.

7. Assign small groups to each topic. Explain that the purpose of the research is to explain their assigned method to the others by means of an oral presentation and display. Explain

that they must evaluate the method in terms of costs (labor, expertise, materials, limitations on expansion), benefits (amount of water generated/saved), and possibilities (future technologies, etc.).

8. Have each group find a general description of its method by looking in an encyclopedia or at the US Geological Survey Water Glossary at http://wwwga.usgs.gov/edu/dictionary.html. Then instruct each group to write a description or definition of their assigned topic in their own words on the bottom of their Cape Verde Study Guide Sheet.

Procedure-Day Three

1. Distribute six note cards to each student. Have them write the headings "costs," "benefits,: "possibilities for the future," "historical context," "explanation of how the method works," and "sources" on the cards. Discuss the meaning of each term.

2. Tell students that the remainder of the period will be used to conduct the research necessary to create their group display and prepare a presentation. Pass out the student sheets they will need: Electronic Resources List, Water in Africa Web Site Reference Sources, and The Evaluation Rubric.

3. Connect the computer to one of the desalination Web sites on the Electronic Resource List. Demonstrate how to fill in the note cards using information from the Web site.

4. After demonstrating how to conduct this research, direct their attention to the Electronic Resource List and the Water In Africa Reference Sources. Tell them these websites are useful sources of information for their research. Suggest that they begin with the Water in Africa Web site to gain anecdotal information, and then move on to the other web sites for more scientific explanations.

5. Draw their attention to the Evaluation Rubric for the oral presentation and display. Make sure each group knows they are responsible for a research summary, which will serve as the basis for the oral presentation and display. Facilitate group research for the rest of the period. Assist individual groups in writing a summary of what they have learned about their topic.

Procedure-Day Four

1. During this class period, small groups will be finishing their research and preparing the oral presentations and displays. Before they begin, discuss how the groups will use their research summaries to create oral presentations and displays. Refer to the Assessment Rubric. Go through each area of the rubric to make sure groups understand what is required. Focus on the first descriptor in Content Accuracy "important, related information." Give examples from student research note cards of important and unimportant information.

2. Focus on the Process criterion-"All group members participated." Review the benchmarks for the Life Skills Working With Others Standard: "Helps the group establish goals," "Takes the initiative when needed," and "Evaluates the overall progress of a group toward a goal." Demonstrate how group members can use these behaviors during project work time.

3. Share two or three examples of visually appealing displays that show attention to detail. Discuss the features that make them "visually appealing " and give them "attention to detail."

4. Establish a due date for oral presentations and displays. Facilitate the research and the preparation of the final products.

5. Invite parents or other members of the school community, as you deem appropriate. It would also be appropriate to invite water-related professionals who live or work in your area to attend the presentations. They could supplement the information presented with their own information. Such professionals might also be useful sources of information during student research on Days Two and Three.

Procedure-Day Five

1. This day is designed to allow the small groups to share the results of their research with the other members of the class. Tell the class they will be participating in a simulation of Cape Verdean society in order to help them understand the situation there.

2. Divide the class into eight groups. Give each group a copy of the Cape Verde Simulation Scenario. Assign each group one of the eight roles: government official, board member of a large foundation, Peace Corps Volunteer coordinator, high school student, farmer, housewife and member of the village council, real estate developer, and public health official.

3. Help each group make a list of criteria that would be important to person(s) in making a decision about the use of additional resources for Cape Verde, as explained in the scenario. Advise the small groups to " put themselves in their person's shoes" by thinking about these criteria, as they listen to the presentations and view the displays. Let them know that after the presentations they will be making an important decision on water that will affect Cape Verde for years to come.

4. Have each group give its presentation and display for the students, parents, and other invited members of the school community. Ask any water-related professionals who attend to participate in the question and answer portion of the presentations in order to help clarify concepts and provide information for everyone.

5. After all the presentations are complete, reconvene the eight groups. Tell them they must reach consensus on a decision of the best method of water conservation and/or procurement given the resources available on Cape Verde.

6. Have each small group report back to the large group on the method chosen, and the reasons for the choices. Discuss the challenges the people of Cape Verde face as they confront the continuing problem of obtaining fresh water. Compare these challenges to problems in the United States and other places in the world.

7. Have each student complete an assessment rubric for his/her presentation and display. Collect these self-assessments.

8. While the students are working on their self-assessments, write the benchmarks for working together on the board: " Evaluates the overall progress of a group toward a goal," "Takes the initiative when needed," and "Helps the group establish goals."

9. Convene the groups that worked on the presentations and displays. Ask the groups to discuss their group's effort. Have each person in the group share an oral self-assessment based on the benchmarks written on the board. Let others comment on the speaker's self-assessments. Emphasize the need for positive, constructive suggestions for improvement. Model this process with one or two students before the discussions begin.

10. After the small groups have discussed group effort, have them comment on the quality of their presentations and displays, now that they are complete. Use the assessment rubric as a tool to focus the discussion. Give each person a chance to comment on an aspect of the presentation/display mentioned on the rubric.

Assessment

Complete an evaluation rubric for each student during the presentations. Use this assessment, your observations of the group process discussion, and the student self-assessment to form an evaluation of each student.

Follow-up/Enrichment Activities

Investigate water related problems in your community and compare them to Cape Verde's problems.

Investigate how you community uses Cape Verde's 5 principal methods of water procurement/conservation, and whether they could benefit from any methods not currently used, or from new advancements in existing technologies.

Learn some Portuguese vocabulary, the language spoken in Cape Verde.

Investigate the music of Cape Verde, as mentioned in Brandon Lundy's "water and culture" story.

Trace the Cape Verdean immigrants to the United States. Many Cape Verdeans live in New

England.

Additional Resources

Cape Verde- American Embassy's website. July 2000 http://www.capeverdeusembassy.org

David M. Kennedy Center for International Studies. "Culturgram: Republic of Cape Verde." 1999. Provo, Utah: Brigham Young University.

Groundwater Foundation. "Making Waves" 1992. Lincoln, Nebraska: Groundwater Foundation. A manual on organizing children's water festivals for grades 5-6. These festivals help children learn how to conserve water and stop pollution through hands-on activities. Contact the Groundwater Foundation at P.O. Box 22558, Lincoln, Nebraska 68542-2558 or call 1-800-858-4844 or visit the website http://www.groundwaterfoundation.org

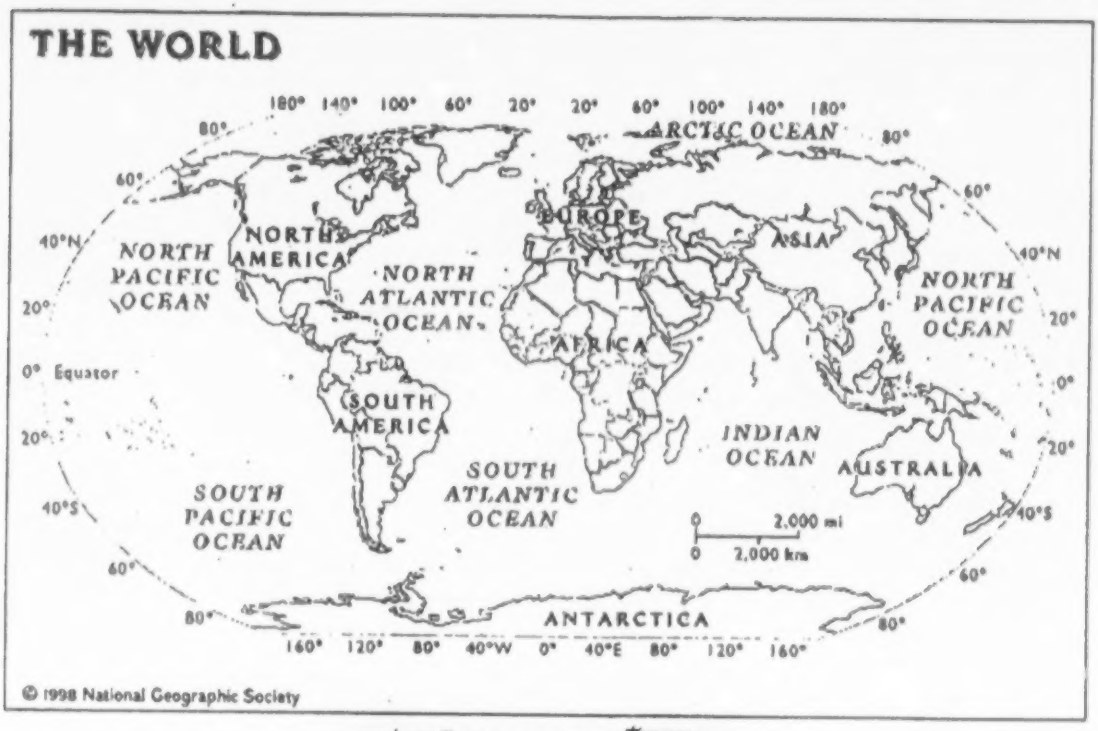
Office of Wetlands, Oceans, and Watersheds' website. July 2000. http://www.epa.gov/owow/

USGS Water Resources of the United States' website. July 2000. http://water.usgs.gov/

U.S. Geological Survey-Branch of Distribution, Box 25286, Denver Federal Center, Denver, CO 80225. 1-888-ask-usgs. Resources available are the posters "Ground Water: The Hidden Resource," "Watersheds: Where We Live," "Water: The Resource That Gets Used and Used and Used for Everything," and "Ocean Coastal Hazards" for grades 3-5 or 6-8.

About the Author

Robert Maher has been an elementary teacher for 23 years in Southeast Ohio. One of the highlights of his career was the visit by Returned Peace Corps Volunteer Jim Ward (of Jeffersonville, Ohio) to his classroom, following a two-year correspondence arranged by World Wise Schools. Jim had been stationed in Maio, Cape Verde. Bob currently corresponds with another Volunteer stationed on Santo Antao, Cape Verde. He commented on his unit: "The research groups prepared oral presentations and displays to demonstrate their understanding of their assigned topic. We did a simulation to stimulate student interest in thinking about the presentation topics. This was difficult for fourth graders, but it really focused their attention on the methods of obtaining and conserving fresh water. I liked the idea of the simulation--the concept could be applied in other situations with oral presentations, too."



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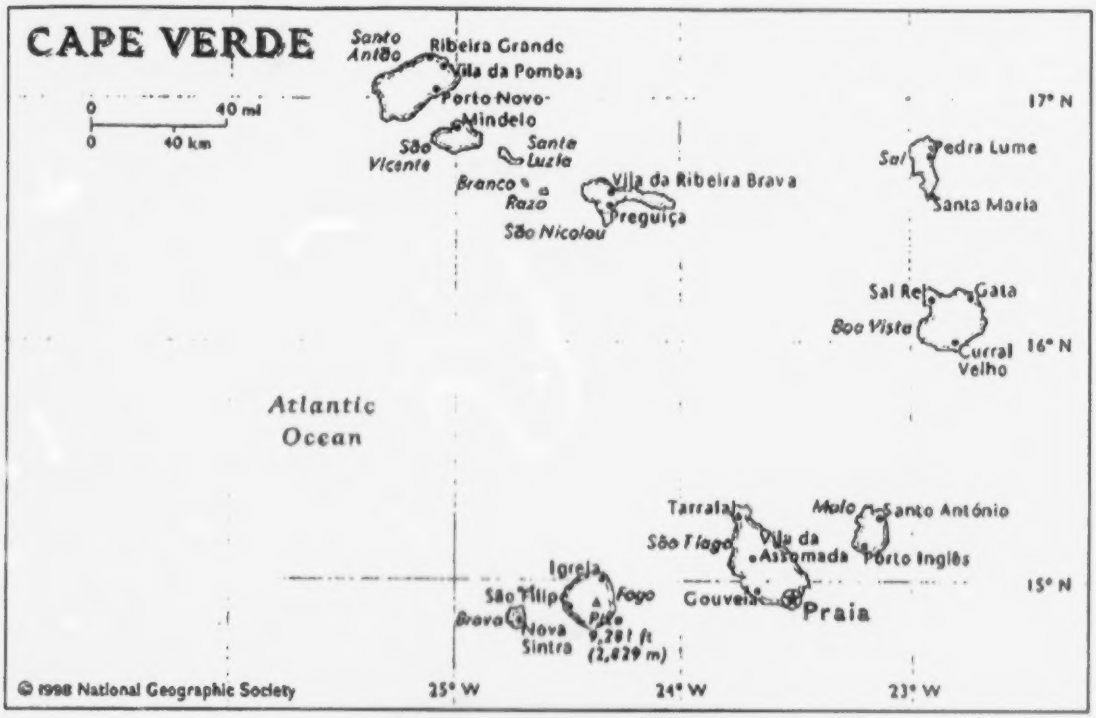

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The Source of My Water

By Brandon Lundy
Sao Domingos, Cape Verde Islands

The Republic of Cape Verde consists of nine inhabited islands located four hundred and sixty kilometers off the coast of West Africa in a region know as the "sahel." The encroachment of the Sahara Desert has effected this country for years. Cape Verde's history has been shaped by a scarcity of natural resources, especially "agua." Aggravated by recurrent drought, including a seventeen year drought during the 1970's and '80's, agricultural production has consistently fallen below local consumption needs. As late as 1947, twenty percent of the country's population died of starvation during a period of drought.

Therefore, water conservation is extremely important. The local government supplies most peoples' water by truck. The water is delivered to "chafariz's" where women wait in line with buckets from early in the morning. They are charged five escudos (five cents) per bucket with a limit of five buckets. The water trucks obtain water from the desalinization plant or from pumps that extract ground water. Pumps are regulated closely with strict limitations on the amounts anyone can take from the ground.

My water is brought to my house by the water truck and pumped into the tank on the roof. Water must be filtered, boiled, and bleached. I have discovered how to wash to large loads of laundry in less than fifteen liters of water and they are clean! My entire morning shower takes less than one bucket of cold water and washing dishes takes less than two liters. Shower water also makes great mop water!

Transportation

Cape Verde has limited resources. The ocean is probably their biggest resource. They receive food, drinking water, salt, and transportation from the ocean. Family members who have emigrated to other countries in search of work and are living abroad send remittances to relatives remaining behind. Most food and goods found in markets are shipped to Cape Verde from abroad.

Since the country is made up of nine islands, travel between islands is very important. Close islands have ferry services which helps spread goods throughout the islands.

Cape Verde Study Guide

1. What are three reliable, long-term methods of obtaining fresh water directly?

2. What are some reasons for the lack of fresh water is Cape Verde?

3. What are two important water conservation techniques practiced by farmers in Cape Verde?

4. What are two other water collection methods mentioned in the pictures and captions?

5. What is an unusual method of water storage used in Cape Verde? Why do you think it is used?

6. Cape Verde consists of _____ volcanic islands with sharp jagged mountains.

7. What benefits does the ocean provide to Cape Verdeans?

8. Cape Verdeans, who were "hosts" to slave ships and slaves in the American South shared some common methods of dealing with hardship. Name them.

9. Five buckets a week of water is the standard ration of water for Cape Verdean families. Describe all the activities which must be undertaken with this limited amount of water.

10. How does lack of access to safe water and sanitation impact public health?

Cape Verde Study Guide

Answer Sheet

1. Desalination, Pumping water from mountain springs, digging wells, a very short rainy season.

2. The climate;
   An extended period of years of below average rain in the rainy season;
   Inability to store rain during the rainy season;
   The land lets the rain "run off" instead of "soaking in" because of the terrain;
   Poor water management practices by people living there.

3. Collecting rainwater in huge cement basins and drip irrigation.

4. Using buckets to collect rainwater from roadside barrels; digging holes in dry stream beds.

5. Storing water on roofs of houses in huge "catch basins."
To maximize use of space around the home because of the difficulty in creating space for peoples' homes, and the number of people who need to use the available space. It also cuts down on the amount of labor and materials needed for water storage.

6. Nine inhabited islands.

7. Transportation; fresh water; food; salt

8. Using music and prayer to dramatize and communicate their distress during times of trouble.
Forming close-knit communities to support each other during these times.

9. Cleaning laundry, bath, toileting, dishes, drinking, cooking etc.

10. Diarrhea and water-born diseases continue to be the primary cause of infant mortality in Cape Verde.

Cape Verde Islands

Background

The Cape Verde archipelago is located approximately 375 miles off the coast of West Africa. It is comprised of nine inhabited islands and eight islets. The islands have a combined size of just over four thousand square kilometers (roughly the size of Rhode Island). The islands are divided into the Barlavento (windward) islands (Santo Antão, São Vicente, Santa Luzia, São Nicolau, Sal and Boavista) and the Sotavento (leeward) islands (Maio, Santiago, Fogo and Brava). The largest island, both in size and population, is Santiago, where the capital, Praia, is located.

Of volcanic origin, the spectacular islands, which boast some of the most beautiful beaches in the world, vary widely in terrain. A still active volcano on the island of Fogo is the highest point on the archipelago (elevation 2,829 meters). Extensive salt flats are found on Sal and Maio. On Santiago, Santo Antão and São Nicolau arid slopes give way in places to sugarcane fields or banana plantations spread along the base of towering mountains. The climate is tropical, but the archipelago's location in the Sahel belt makes it the victim of periodic and devastating droughts interspersed with years of greater - yet still less than adequate rainfall. Two of the most severe droughts, from 1830 to 1834 and in 1963, claimed over thirty thousand lives each.

The Portuguese discovered and explored the Cape Verde islands between 1460 and 1462 in expeditions led by Antonio de Noli, Diego Gomes and Diego Afonso, but the archipelago was certainly known to the West African coastal empires and had been visited in antiquity by Arab geographers and even, some theories hold, by the Greeks. Most historians contend that the islands were uninhabited at the time of the first Portuguese explorations but evidence suggests that Santiago Island was the refuge for a small group of shipwrecked Djalof seamen from the Cap-Vert peninsula in what is now Senegal.

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As the slave trade to Cape Verde intensified over the next few centuries, so too did economic activity on the islands. Corn, brought from Brazil, quickly became the staple of the diet and was the earliest export crop. Beans, manioc and sweet potatoes were also imported and grown for domestic consumption. Sugarcane, introduced from the Canary Islands, became another valuable export crop in the form of *grogue*, or rum. Exports of raw cotton began as early as 1506, and wines for export were produced beginning in the late 18th century, but both of these declined in importance relatively rapidly: raw cotton exports ended with the importation of cloth from Guinea-Bissau, and wine exports in any significant quantity ceased in the late 19th century due to a lack of demand.

Aside from agriculture, animal husbandry played an important part in the Cape Verdean economy from the fifteenth century on, and exports of salted beef and tanned hides began in 1490 from the islands of Boa Vista and Maio. For nearly 200 years the extraction of salt was the country's biggest export. Cape Verdean salt found markets as far away as New England, the West Indies, Argentina and Brazil. The industry crashed in 1862 when Brazil instituted an import tax on salt.

Cape Verde Islands

Emigration from Cape Verde began in the late 1600s and has continued since. Traditional points of destination have been Portugal, Brazil, Holland, France and the US. The majority of the early immigrants to the US came from the islands of Fogo and Brava, serving on US whaling ships operating in the tropical Atlantic. Many moved permanently to the US. The Portuguese encouraged educated Cape Verdeans to enter the colonial service and move to other Portuguese territories. In the 1960s, Cape Verdeans were drafted into the Portuguese army and served in other overseas territories as soldiers. As a result, large Cape Verdean communities exist in Guinea-Bissau, São Tomé and Principe, Angola, and Mozambique. By far, though, the largest overseas Cape Verdean community is in the United States, principally in Rhode Island and the Boston area.

Government

Cape Verde defines itself as a sovereign, democratic, and anti-imperialist Republic. The government structure has three branches; legislative, executive and judicial. The National Assembly constitutes the legislative branch. It determines fundamental internal and external policies and organizes and controls the political, economic, cultural, social and defense lines of action. The Assembly is directed by a steering committee composed of the President of the National Assembly and four other members. Its members, "Deputados da Nação", are elected through national elections every five years; all citizens may be candidates. The Assembly ordinarily meets twice a year.

The executive branch is composed of the President, elected every five years, and the Council of Ministers, elected by the National Assembly from within the ranks of the party with the most seats. The President is the head of state and of the armed forces. The Council of Ministers is the executive and administrative organism; it consists of the Prime Minister, who is the head of government, plus a number of Government Ministers and Secretaries of State.

The judicial branch is headed by a Supreme Court composed of five justices named by the President, the Executive branch and the Lawyers' Association.

On February 17, 1991, Cape Verde held its first free presidential elections. Former judge Antonio Mascarenhas Monteiro's victory marked the first time an African head of state voluntarily turned over power to his successor as the result of democratic elections.

The Economy

Classified by the World Bank as a lower middle income country, the economy of Cape Verde remains oriented towards agriculture and fishing although services (essentially government investment spending) account for the majority of GDP. After more than ten years of drought, it has rained sporadically since 1984. During 1997, the majority of the rain fell during one week resulting in massive crop failures throughout the country. 1998 was worse. The country's small size, isolation and lack of natural resources mean that, even without the handicap of drought, development possibilities would be limited. Given this, the economy has achieved an impressive growth record since independence. Huge efforts deployed to preserve the soil and vegetation, to improve water management and careful management of international aid, have meanwhile ensured a sufficient supply of food. Despite all these moves, however, the majority of Cape Verdeans continue to eke out a living from the production of the islands' traditional dietary staples and small animal husbandry.

Cape Verde Islands

Society and Culture

The European men who colonized Cape Verde did not usually bring wives or families with them. As female African slaves were brought to the island, European men took them as wives. The intermingling of European and African is not simply genetic; it extends to sociocultural patterns and language as well. The social and cultural patterns of the population are similar to those of rural Portugal, but some African patterns remain. Many still use the traditional African methods of carrying things on their heads and carrying children tied by scarves to their backs. The role of women in society also reflects the traditions of both Africa and Europe.

Western religion, to some extent, has diluted African cultural traditions. Catholicism, brought by the Portuguese, has always been Cape Verde's primary religion, though some Protestant sects (especially the Seventh Day Adventists, the Mormons and the Nazarenes) have attracted followers. Despite bans by the Portuguese colonists, some vestiges of African animism remain in superstitions and magic rituals.

From: "Welcome to Cape Verde, Country Information Packet" Peace Corps, 2000

Electronic Resource List

Water Glossary

U.S. Geological Survey Water Glossary
http://wwwga.usgs.gov/edu/dictionary.html

Cape Verde Water Sources

"Everyone lives downstream"
http://www.unicef.org/programme/wes/pubs/watfrnt/wf13e.pdf

Web Sites About Desalination

Organization of American States
Desalination by Reverse Osmosis
http://www.oas.org/usdc/publications/Unit/oea59e/ch20.htm#2.

California Coastal Commission
Seawater Desalination in California
http://www.coastal.ca.gov/desalrpt/dkeyfact.html

California Coastal Commission
Seawater Desalination in California
Glossary
http://www.coastal.ca.gov/desalrpt/dglossar.html

Solar Web Desalination Index
http://www.serve.com/damien/home/solarweb/desal/index.html

Web Sites About Pumps and Wells

United Nations Food and Agricultural Organization
Wells http://www.fao.org/inpho/vlibrary/s1250e/S1250E1e.htm#Wells

Pumps http://www.fao.org/inpho/vlibrary/s1250e/S1250E1e.htm#Pumps

Web Sites About Irrigation

Irrigation Water Management: Irrigation Methods
http://www.fao.org/docrep/S8684E/s8684e00.htm

Austin Lawn Sprinklers Association
http://www.alsaustin.org/irreq-drip.htm

Electronic Resource List

Web Sites About Rainwater Catchment Systems

Organization of American States
Rainwater Harvesting from Rooftop Catchments
http://www.oas.org/usde/publications/Unit/oea59e/ch10.htm

REPORTS Science from the Developing World
http://www.idrc.ca/reports/read_article_english.cfm?article_num=294

IDRC: Adventures in Development
Soil and Water Conservation-Tanzania
http://www.idrc.ca/adventure/soil.html

Humboldt State University
Campus Center for Appropriate Technology
Rainwater Catchment System and Rope Pump
http://www.humboldt.edu/~ccat/water/rain.html

Web Sites About Mountain Springs

U.S. Geological Survey – Ground Water Use in the U.S., Earth's Water: Ground Water
www.usgs.gov/edu/wugw.html
www.usgs.gov/edu/earthgw.html

Water in Africa Web Site Reference Sources

Pumps and Wells

	Photos	Stories
Guinea	GN0204 GN0309	
Togo	TG0112 TG0115	Source of Your Water by Nathan McFall

Irrigation (irrigation ditches; rain gutters; collection ditches; drip irrigation)

	Photos	Stories
Guinea		Managing Water By Jesse Thyne
Tanzania	TZ0217 TZ0216	

Rainwater Collection Systems (huge cement basins)

	Photos	Stories
Kenya	KE0608 KE0535 KE0528 KE0526	The Source of Your Water
Mauritania	MR0224	
Togo	TG0111 TG0301 TG0317	

Mountain Springs

	Story
Togo	The Source of Your Water

Evaluation Rubric for Cape Verde Presentation and Display

Student Name _____ **Date** _____

Assignment An oral presentation 7-10 minutes long and visual display

Topic A method of conserving or obtaining fresh water in Cape Verde

Requirements

- Each group will concentrate on one particular method used in Cape Verde, as demonstrated by the photos/stories we have studied.
- Each presentation should include a cost/benefit analysis for their particular method, which includes the strong points and weaknesses of expanding this method in Cape Verde to obtain more fresh water.
- Each group is responsible for material cited in the rubric.
- Two minutes of the presentation time will be used for questions from the audience, who will be assuming the role of various parties interested in obtaining fresh water in Cape Verde.

Area	Points	Descriptor
Content Accuracy	/30	The students: • Accurately presented important, related information on the presentation and the display. • Included a cost/benefit analysis for the method. • Presented information on the historical context and future possibilities (new technologies) for the method.
Content Depth	/20	The students: • Connected Cape Verdean methods to those in other places. • Used at least three reference sources which were cited.
Process	/10	The students: • Included evidence that all group members participated in the research, preparation, and presentation/display.
Presentation and Neatness	/30	The students: • Used note cards for the presentation, as needed, and included audience interaction • Spoke with the proper volume, clarity, and grammar while making eye contact with the audience • Created a visually appealing display that showed attention to detail.
Creativity	/10	The student: • Used original methods.
Total	/100	

Comments

Cape Verde Simulation Scenario

Directions: Each small group will be assigned one of the roles described below. After the presentations, the small groups will meet and discuss which of the methods they would pursue, given the resources available. All groups must keep within the roles they have been assigned while they discuss the issue and come to a decision.

Role 1- You are a government official from Cape Verde. The government must decide how to get the most fresh water it can, without endangering the supply for the future. You must choose one method for a large project funded by international lenders. The project must include a method which the government can continue after the initial funding period of two years ends. Which method do you pick?

Role 2- You are a board member of a large foundation. You have been approached by Cape Verdeans who have learned of your interest in keeping an adequate supply of fresh water for all living things for the future. The Cape Verdeans want to know which method of obtaining water looks the most promising to you, so they can write a grant to your foundation. Which method would you recommend?

Role 3- You are a Peace Corps Volunteer coordinator in Cape Verde. You need a successor to Volunteer. Brandon Lundy to help people in Cape Verde work on water issues. Which method do you want the new Volunteer to work on as part of his/her assignment on Cape Verde?

Role 4- You are high school students in Cape Verde. You recognize the need for additional fresh water. Your group must work on a community project to help raise public awareness of water sources. Which method would you choose to educate people about your project?

Role 5- You are a farmer in a mountainous region of Cape Verde. You need additional water to extend the growing season for your land. Which method will you use?

Role 6- You are a housewife, and a member of the village council. Because you stand in line at the chafariz (water tank) to obtain your five buckets of water and because you are aware of education efforts about proper sanitation and water, you know the importance of a dependable supply of useable fresh water to your village. The council wants to apply for a grant to get additional fresh water. The grant money can fund supplies, equipment, or training for a method of obtaining additional water. Which method works best for you and your village?

Role 7- You are a real estate developer in Praia. You need additional fresh water for the tourist hotel you plan to build to use your nation's beautiful beaches for financial benefit, and economic growth. Which method do you favor?

Role 8- You are a public health official who works for the camaras (local government). You know that more fresh water is both a problem (in terms of its pollution through unhealthy uses by an uneducated public) and a solution (in terms of access to water that does not spread diseases) for Cape Verde. Which method would you advocate to increase the fresh water supply?